UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte YASUTAKI ISHII, TAKAHIRO IWAHAMA and TATSUYA NAKANO

Appeal No. 2006-0645
Application No. 09/622,001

ON BRIEF

Before ADAMS, MILLS, and GRIMES, Administrative Patent Judges.

MILLS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1, 3 and 21 which are on appeal in this application. Claims 23 and 24 are also pending and have been indicated by the examiner to be allowable. Advisory Action, March 31, 2005). Claims 2 and 4 are also pending but have been withdrawn from consideration; claims 4-13 and 22 have been cancelled. Brief, page 2.

Claims 1, 3 and 21 read as follow:

1. A process for producing an organic compound which is an addition or substitution reaction product of a compound (A) and a compound (B) or an oxidized product thereof, wherein said product is selected from the group consisting of

(i-1) an addition reaction product or an oxidized product thereof, where an adjacent position to an oxygen atom of a compound (A1) is bonded to a carbon atom of an unsaturated bond of an unsaturated compound (B1) when an oxygen-atom-containing compound (A1) is employed as a compound (A),

(i-2) a substitution reaction product or an oxidized product thereof, where an adjacent position to an oxygen atom of a compound (A1) is bonded to a methine carbon atom of a compound (B2) having a hydrocarbon group with a methine carbon atom when an oxygen-atom-containing compound (A1) is employed as a compound (A),

(ii-1) an addition reaction product or an oxidized product thereof, where a bond between a carbonyl group and an atom adjacent to a carbonyl group of a compound (A2) is broken, and a group containing the a carbonyl group is bonded to the aforementioned position of a compound (B1) when a carbonyl –group containing compound (A2) is employed as a compound (A),

(ii-2) a substitution reaction product or an oxidized product thereof, where a bond between a carbonyl group and an atom adjacent to a carbonyl group of a compound (A2) is broken, and a group containing the a carbonyl group is bonded to the aforementioned position of a compound (B2) when a carbonyl-group containing compound (A2) is employed as a compound (A),

(iii-1) an addition reaction product or an oxidized product thereof, where a methine carbon atom of a compound (A3) is bonded to the aforementioned position of a compound (B1) when a compound (A3) containing a hydrocarbon group with a methine carbon atom is employed as a compound A, and

(iii-2) a substitution reaction product or an oxidized product thereof, where a methine carbon atom of a compound (A3) is bonded to the aforementioned position of a compound (B2) when a compound (A3) containing a hydrocarbon group with a methine carbon atom is employed as a compound A, said process comprising the step of allowing (A) a compound capable of forming a stable radical and being selected from

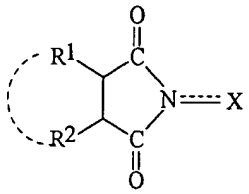
(A1) oxygen-atom-containing compounds each having a carbon hydrogen bond at the adjacent position to an oxygen atom,

(A2) carbonyl-group-containing compounds, and

(A3) compounds each having a hydrocarbon group with a methine carbon atom to react with (B) a radical scavenging compound selected from

(B1) unsaturated compounds, and

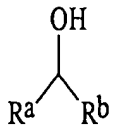
(B2) compounds each having a hydrocarbon group with a methine carbon atom, provided that if a 1,2-dicarbonyl compound or its hydroxy reductant is used as the compound (A), the compound (B) is a radical scavenging compound (B1) in the presence of a catalytic imide compound and in the presence of molecular oxygen, by catalysis of the imide compound, wherein the imide compound is shown by the following formula (1):



(1)

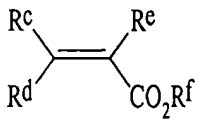
wherein each of R^1 and R^2 is, identical to or different from each other, a hydrogen atom, a halogen atom, an alkyl group, an aryl group, a cycloalkyl group, a hydroxyl group, an alkoxy group, a carboxyl group, an alkoxycarbonyl group, or an acyl group, where R^1 and R^2 may be combined to form a double bond, or an aromatic or non-aromatic ring; X is an oxygen atom or a hydroxyl group; and one or two N-substituted cyclic imido groups indicated in the formula (1) may be further bonded to said R^1, R^2, or to the double bond or aromatic or non-aromatic ring formed together by R^1 and R^2, to yield a product of an addition or substitution reaction of said compound (A) and said compound (B) or an oxidized product thereof.

3. The process for producing an organic compound according to claim 1, which process comprises an addition reaction wherein compound (A) is (All) an alcohol shown by the following formula (2):



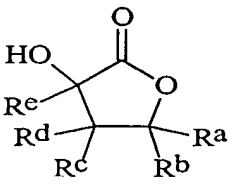
(2)

wherein each of R^a and R^b is, identical to or different from each other, a hydrogen atom or an organic group, where R^a and R^b may be combined to form a ring with the adjacent carbon atom, and compound (B) is (B12) an α,β-unsaturated carboxylic acid derivative shown by the following formula (5):



(5)

wherein each of R^c, R^d, R^e, and R^f is, identical to or different from one another, a hydrogen atom or an organic group, where R^c, R^d, and R^e may be combined to form a ring with the adjacent carbon atom or carbon-carbon bond, and wherein the organic compound which is an addition or substitution reaction product or an oxidized product thereof is an α-hydroxy-γ-butyrolactone derivative shown by the following formula (6) :



(6)

wherein R^a, R^b , R^c, R^d, and R^e have the same meanings as defined above.

21. A process according to one of claims 1 to 3 and 14 to 20, wherein a metallic compound is used as a co-catalyst.

No prior art is relied on by the examiner.

Grounds of Rejection

Claims 1, 3 and 21 stand rejected under 35 U.S.C. § 112, second paragraph for indefiniteness.

Claims 1, 3 and 21 stand rejected under 35 U.S.C. § 112, first paragraph for lack of enablement.

These rejections are reversed.

DISCUSSION

According to the specification, page 2

> [s]ome useful organic compounds are known to be produced by adding a variety of compounds to an unsaturated compound having, for example, a carbon-carbon double bond or a heteroatom-containing compound. For example, when an active methylene compound such as a malonic diester is allowed to react with an olefin having an electron attracting group such as acrylonitrile in the presence of a base, a carbon-carbon bond is formed by a nucleophilic addition reaction to yield an adduct (Michael addition reaction). When two carbonyl compounds are treated in the presence of an acid or a base, one carbonyl compound is nucleophilically added to the other carbonyl compound and a carbon-carbon bond is formed to yield an aldol condensate.
>
> However, a reaction is generally performed in the presence of an acid or a base according to these processes, and these processes cannot be applied to compounds having substituents that are unstable to acids or bases. According to these processes, for example, a hydroxymethyl

> group, an alkoxymethyl group, an acyl group, or a tertiary carbon atom cannot be directly bonded to a carbon atom constituting an unsaturated bond of an unsaturated compound or to a methine carbon atom of a bridged cyclic compound.

The specification, page 1, discloses that

> [t]his invention relates to a process for producing an organic compound using an imide compound catalyst.
> Specifically, the invention relates to a process of allowing two compounds to react with each other in the presence of a specific imide compound and a radical generator with respect to the imide compound to yield a product of an addition or substitution reaction or an oxidized product thereof by a radical mechanism.

The appellants found that the "use of an imide compound having a specific structure can yield a corresponding addition or substitution reaction product or an oxidized product thereof, under mild conditions, through a reaction of a compound which is capable of forming a stable radical with a radical scavenging compound in the presence of oxygen and/or a radical generator with respect to the imide compound." Specification, page 9.

35 U.S.C. § 112, second paragraph

Claims 1, 3 and 21 stand rejected under 35 U.S.C. § 112, second paragraph for indefiniteness.

The examiner takes the position that (Answer, page 3)

> [I]n the instant claims, the regents and products are not sufficiently identified and therefore, are not clear or distinct. Under 35 USC 8, MPEP 903, each claim must be classified, and in a process claim the classification is determined by the product. "Organic compound" is not a sufficient identity of a compound. It is analogous to saying "automobile" or "vehicle" is the same as "Toyota Camry", Infinity QX4 SUV "Ford Trailer."

The Final Rejection, page 6, articulates

> [c]laims 1, 3 fail to recite the specific reagents and product thereof. Applicant cannot claim all compounds of (A1), (A2) and (A3), capable of forming a stable radical; all radical scavenging compounds of (B1), (B2) and (B3) that are applicable in the instant process. Also, the product of the reaction is not recited in the claims. Applicant must claim only the reagent compound(s) that embody applicant's invention. Therefore, claims 1, 3, 21 are indefinite. A claim must stand alone to define the inventions, and incorporation into the claims by reference to the specification or an external source is not permitted. Ex parte Fressola, 27 USPQ 2d 1608, Bd Pat App & Inter.(1993). In patent examination, it is essential for claims to be precise, clear, correct, and unambiguous. In re Zlefz, 893 F.2d 319, 13 USPQ2d 1320 (Fed. Cir. 1989).

The examiner's concern appears to be that the objected to term "organic compound" in the claimed process is over-broad, that the claims do not recite a specific product or reactants, and for this reason the examiner concludes that the claims are indefinite. We disagree. It is well settled that claim "breadth is not to be equated with indefiniteness". In re Miller, 441 F.2d 689, 693, 169 USPQ 597, 600 (CCPA 1971); see also In re Hyatt, 708 F.2d 712, 714-15, 218 USPQ 195, 197 (Fed. Cir. 1983). In our view, appellants' claims reflect the discovery of a process using an imide catalyst for nucleophilic addition or substitution reactions which take place under mild reaction conditions. Thus, the claims are directed to a process of preparing a group of organic compounds which use a similar reaction mechanism and not to specific organic compounds. While the claim generally indicates the product of the process is an organic molecule, the claims go on to specifically define the attributes that the reactant molecules (A) and (B) must possess in order to be subject to the substitution or addition reaction using the specifically defined imide catalyst having formula I. The organic

compounds produced by the claimed process are those which naturally result from reaction of the described reaction molecules in the presence of the imide catalyst.

In view of the above, we do not find the examiner has presented convincing argument of claim indefininteness and the rejection for claim indefiniteness is reversed.

35 U.S.C. § 112, first paragraph

Claims 1, 3 and 21 stand rejected under 35 U.S.C. § 112, first paragraph for lack of enablement.

In order to establish a prima facie case of lack of enablement, the examiner must provide a reasonable explanation as to why the scope of protection provided by a claim is not adequately enabled by the disclosure. In re Wright, 999 F.2d 1557, 1561-62, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993); In re Morehouse, 545 F.2d 162, 165, 192 USPQ 29, 32 (CCPA 1976). The threshold step in resolving this issue is to determine whether the examiner has met his burden of proof by advancing acceptable reasoning inconsistent with enablement.

Factors to be considered by the examiner in determining whether a disclosure would require undue experimentation have been summarized by the board in Ex parte Forman, 230 USPQ 546, 547 (Bd. Pat. App. & Int. 1986). They include (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims. In re Wands, 858 F.2d

731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988). The examiner reviews the Wands factors with respect the lack of enablement issue in the Answer, providing reasoning as to why the claims are not enabled.

A sampling of the examiner's response to appellants' arguments (Answer, pages 5-6) with regard to the Wands factors pertinent to the enablement issue follows:

> Wands factors 1 and 2: Applicant contends that the invention relates to only "organic compounds that are addition or substitution reaction products of a compound A and a compound B, and that both compounds A and B are defined in the claims. This is not persuasive because compounds A and B are not defined in the specification and claims with sufficient distinction as required under 35 USC 112...
>
> Wands factors 5, 6 and 7: Applicant contends that "a high degree of predictability is inherent in the invention.["] This is not true because practicing the claims would constitutes a serious and undue burden since one of ordinary skill in the art would have to try all known "carbonyl-containing compounds", all "unsaturated compounds", metallic co-catalysts, etc. to determine which ones are applicable in the instant claims. The relevant examples in the specification are not sufficient to guide one of ordinary skill in the art to practice the instant claims without this undue burden... Applicant asked if only the 38 examples in the specification are enabled. No, because applicant made an election and only the relevant example to the elected process is considered, not all the 38 examples. In considering the relevant example, the examiner noted that substituents such as H, OH, etc. in examples R3 (IFW REM, 9/16/04) are described in the specification and the claims as organic groups, organic hydrocarbons, thereby obliterating the identities of the reagents as well as the products.

Appellants argue that their invention resides in the provision of a class of imide catalysts that can be used in a class of reactions to produce classes of compounds. Brief, page 3. Appellants argue that their claims are limited to addition or substitution reaction products of a compound (A) and a compound (b), or an oxidized product

thereof. Brief, page 7. Appellants further argue that the examiner has failed to address the Wands factor relating to working examples in the specification and argue that the specification provides 38 fully documented working examples illustrating the practice of a wide variety of embodiments of the present invention. Brief, page 10.

In this regard, Appellants argue that, in a previous office action,[1] "the examiner refers to Table R3[2] and indicates that 'by adding the table to the specification and applicable structures to the claims the rejection would be overcome.' Inasmuch as Table R3 is merely a compendium of the thirty-eight (38) working Examples herein, it has been, in effect, added to the specification." Brief, page 11. For this reason, appellants argue that one of ordinary skill in the art would not require undue experimentation to practice the claimed invention. Id. Appellants conclude the examiner has not met his burden of proof to establish a rejection upon failure to satisfy the enablement requirement. Brief, pages 11-12.

We do not find that the examiner has presented convincing evidence that the claims are based on a non-enabling specification. The specification provides 38 working examples of the claimed process and an indication of specific organic compounds produced by the claimed process. In our view, the examples themselves are evidence of enablement of the claimed process of preparing an organic compound. The examiner, on the other hand, has not presented any evidence that any embodiment within the scope of the pending claims is inoperable or that the

1 Final Rejection dated December 6, 2004, page 5.
2 Table R3 was presented in the Amendment filed September 16, 2004, page 22.

specification lacks a sufficient disclosure of how to make a specific organic compound within the scope of the claims. In view of the above, the evidence of enablement weighs in favor of appellants and the rejection of the claims for lack of enablement is reversed.

REVERSED

Donald E. Adams
Administrative Patent Judge

Demetra J. Mills
Administrative Patent Judge

Eric Grimes
Administrative Patent Judge

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DJM/jlb

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